UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/935,844	09/23/1997	ROBERT WILSON	E0295/7021	9098

7590 05/19/2006

RICHARD F GIUNTA
WOLF GREENFIELD AND SACKS
FEDERAL RESERVE PLAZA
600 ATLANTIC AVENUE
BOSTON, MA 022102211

EXAMINER	
MCLEAN MAYO, KIMBERLY N	
ART UNIT	**PAPER NUMBER**
2187	

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 08/935,844
Filing Date: September 23, 1997
Appellant(s): WILSON ET AL.

Richard F. Giunta
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed appeal brief resubmitted January 21, 2005 appealing from the Office action mailed October 21, 2004.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5544347	Yanai	8-1996
5991813	Zarrow	11-1999
5960216	Vishlitzky	9-1999

5212784	Sparks	5-1993
5537533	Staheli	8-1994
5835953	Ohran	11-1998

Back, U., Computer Networks Protocols, Standards and Interfaces, 2nd Edition, December, 1993, pp 159-161

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

A. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

B. Claims 1-2, 5, 10-12, 19, 39-40, 46-48 and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of the admitted prior art Yanai (USPN: 5,544,537).

Regarding claims 1, 10-12, 39, 46-47 and 51-52, Zarrow discloses a computer system comprising a CPU (inherent to a computer; Figure 1, Reference 10); a first storage system that is coupled to the CPU to store information written from the CPU (Figure 1, Reference 16); a second storage system (Figure 1, Reference 18); at least one communication link coupling the second storage system to the CPU, the at least one communication link including a network cloud (WAN) that is shared with at least one other resource so that no portion of the network

cloud is dedicated exclusively to transferring information between the CPU and the second storage system (Figure 1, Reference 14; C 2, L 1-3); and a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud (C 4, L 41-67; C 5, L 1-35). Zarrow does not explicitly disclose the communication link extending between the first and second storage systems such that the second system is coupled to the CPU via the first storage system. However, Yanai does teach this feature (Figure 1, Reference 40; C 4, L 50-56). Yanai teaches that this feature allows data mirroring from a primary data storage system to a secondary storage system without the intervention of the host which improves the performance of the system (C 2, L 25-33). Yanai also teaches that host (server) intervention seriously degrades the performance of the data transfer link between the host computer and the primary storage device. One of ordinary skill in the art would have also recognized that this feature allows the host to perform other task while the storage controller performs the mirroring operation, thereby improving the performance of the system. Therefore, one of ordinary skill in the art would have been motivated to add the teachings of Yanai to the teachings of Zarrow (remote mirroring over a WAN) for the desirable purpose of improved performance.

Regarding claims 2, 19, 40 and 48, Zarrow teaches a WAN (Internet) (C 2, L 1-3).

Regarding claim 5, Zarrow teaches data mirroring over a WAN. A WAN comprises many resources. The protocol implemented in such a network allows for communication between any of the resources.

Regarding claims 3, 18, 41 and 49, Zarrow teaches the concept of data mirroring over a network (WAN) as cited in claims 1, 39 and 47 above. Zarrow does not explicitly teach an Intranet network. However, mirroring is well known in the art for increased reliability which is a desirable feature in a network. Therefore, it would have been obvious to one of ordinary skill in the art to use the teachings of Zarrow and Yanai in an Intranet network for the desirable purpose of reliability.

C. Claims 4 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of the admitted prior art Yanai (USPN: 5,54,537) as applied to claim 1 and further in view of Black (Computer Networks: Protocols, Standards and Interfaces, 2nd Edition, 1993).

Zarrow and Yanai teach the limitations cited above in claim 1; however, Zarrow nor Yanai explicitly teach a packet switched and cell network communication link. Yet, it is evident that issues such as applications, cost and other factors would dictate the use of one type of communication link versus another. It is really an issue of design choice. Black teaches in Computer Networks: Protocols, Standards and Interfaces, pages 159 -161, that organizations with low to medium traffic volumes could benefit from a packet switch network because most of the carriers charge on the volume of traffic. Thus it would have been obvious to one of ordinary

skill in the art to use the teachings of Zarrow and Yanai in a packet switch and cell network for a system with low to medium traffic volumes for the desirable purpose of efficiency and cost.

D. Claims 6-8, 15-16, 20-21, 42-44 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of the admitted prior art Yanai (USPN: 5,544,537) and Vishlitzky (USPN: 5,960,216).

Zarrow and Yanai disclose the limitations cited above for claims 1 and 39. However, Zarrow nor Yanai explicitly disclose a communication link comprising a plurality of communication paths for parallel transfer of packets. Vishlitzky discloses using a plurality of communication paths for parallel transfer of packets (Figure 3a, Reference 21a-21b; C 4, L 62-67; C 6, L 27-47). It also known in the art to transfer data on parallel paths for increased throughput (such as Packet switch networks). Vishlitzky teaches that this feature enhances reliability by providing more than one path(channel) in case of a failure in one of the channels and this feature increases bandwidth by transferring data on all the channels compared to just a single channel. Thus, it would have been obvious to one of ordinary skill in the art to use a communication link comprising a plurality of communication paths to the system taught by Zarrow and Yanai for increased throughput, reliability and improved system performance.

E. Claims 9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of the admitted prior art Yanai (USPN: 5,544,537) as applied to claim 1 and further in view of Sparks (USPN: 5,212,784).

Zarrow and Yanai teach the limitations cited above for claim 1, however, neither explicitly teach a communication link including a wireless connection. Sparks does suggest using a wireless connection as a communication link in a backup/mirroring system (C 7, L 28-36). Sparks teaches that such a configuration would allow transmitting backup/mirroring data offsite immediately thus improving the reliability of the system. It is also well known that wireless connections such as satellites provide a large transmission capacity and improve reliability due to the lack of wires. Thus, it would have been obvious to one of ordinary skill in the art to use a wireless connection in the system taught by Zarrow and Yanai for increased reliability and increased throughput.

F. Claim 13 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of the admitted prior art Yanai (USPN: 5,544,537) as applied to claim 1 and further in view of Sparks (USPN: 5,212,784).

Zarrow and Yanai teach the limitations cited above in claims 1 and 39, however, neither explicitly teaches a third storage system having a third communication link wherein information from the primary storage unit is mirrored thereto. However, Sparks suggest using a third storage system and a third communication link for coupling the storage device to the CPU as an additional backup systems, wherein some of the information stored in the CPU would be mirrored/copied thereto (C 7, L 12-36). Sparks teaches that the additional backup system would provide simultaneous backup copies, thus increasing the reliability of the system (C 7, L 17-20). This concept is also known in RAID technology. Therefore, it would have been obvious to one of ordinary skill in the art to add a third storage device and a third communication link for

storing mirrored information of the first storage device to the system taught by Zarrow and Yanai for increased reliability.

G. Claims 22-30 and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of Sparks (USPN: 5,212,784) and the admitted prior art Yanai (USPN: 5,544,537).

Regarding claims 22, 24-26 and 53, Zarrow discloses a computer system comprising a CPU (inherent to a computer; Figure 1, Reference 10); a first storage system that is coupled to the CPU to store information written from the CPU (Figure 1, Reference 16); a second storage system (Figure 1, Reference 18); at least one communication link coupling the second storage system to the CPU (Figure 1, Reference 14; C 2, L 1-3); and a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information over the at least one communication link (C 4, L 41-67; C 5, L 1-35). Zarrow does not explicitly disclose the at least one communication link comprising at least one wireless connection. However, Sparks does suggest using a wireless connection as a communication link in a backup/mirroring system (C 7, L 28-36). Sparks teaches that such a configuration would allow transmitting backup/mirroring data offsite immediately thus improving the reliability of the system. It is also well known that wireless connections such as satellites provide a large transmission capacity and improve reliability due to the lack of wires. Thus, it would have been obvious to one of ordinary skill in the art to use a wireless connection in Zarrow's system for increased reliability and increased throughput.

Zarrow nor Sparks explicitly discloses the communication link extending between the first and second storage systems such that the second system is coupled to the CPU via the first storage system. However, Yanai does teach this feature (Figure 1, Reference 40; C 4, L 50-56). Yanai teaches that this feature allows data mirroring from a primary data storage system to a secondary storage system without the intervention of the host which improves the performance of the system (C 2, L 25-33). Yanai also teaches that host (server) intervention seriously degrades the performance of the data transfer link between the host computer and the primary storage device. One of ordinary skill in the art would have also recognized that this feature allows the host to perform other task while the storage controller performs the mirroring operation, thereby improving the performance of the system. Therefore, one of ordinary skill in the art would have been motivated to add the teachings of Yanai to the teachings of Zarrow and Sparks for the desirable purpose of improved performance.

Claim 23 is rejected for the same rationale as applied to claim 3 above.

Regarding claims 27-30 and 54-55, it is well known to use satellites and microwave systems for a wireless communication link. It would have been obvious to use either for the desirable purpose of design choice.

H. Claims 31-32 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of Sparks (USPN: 5,212,784) and the admitted prior art Yanai (USPN: 5,544,537).

Zarrow discloses a computer system comprising a CPU (inherent to a computer; Figure 1, Reference 10); a first communication link (Figure 1, Reference 32); a first storage system coupled to the CPU via the first communication link to store information written from the CPU (Figure 1, Reference 16); a second storage system (Figure 1, Reference 18); a second communication link coupling the second storage system to the CPU (Figure 1, Reference 14); and a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system (C 4, L 41-67; C 5, L 1-35). Zarrow does not explicitly disclose a third storage system and a third communication link coupling the third storage system to the CPU. However, Sparks suggest using a third storage system and a third communication link for coupling the storage device to the CPU as an additional backup systems, wherein some of the information stored in the CPU would be mirrored/copied thereto (C 7, L 12-36). Sparks teaches that the additional backup system would provide simultaneous backup copies, thus increasing the reliability of the system (C 7, L 17-20). This concept is also known in RAID technology. Therefore, it would have been obvious to one of ordinary skill in the art to add a third storage device and a third communication link for storing mirrored information of the first storage device to Zarrow's system for increased reliability. Zarrow nor Sparks explicitly discloses the communication link extending between the first and second storage systems and the first and third storage system such that the second system and third storage system is coupled to the CPU via the first storage system. However, Yanai does teach the concept of extending the communication link between a primary and secondary (backup) storage systems such that the secondary storage system is coupled to the host via the first storage system (Figure 1, Reference

40; C 4, L 50-56). Yanai teaches that this feature allows data mirroring from a primary data storage system to a secondary storage system without the intervention of the host which improves the performance of the system (C 2, L 25-33). Yanai also teaches that host (server) intervention seriously degrades the performance of the data transfer link between the host computer and the primary storage device. One of ordinary skill in the art would have also recognized that this feature allows the host to perform other task while the storage controller performs the mirroring operation, thereby improving the performance of the system. Therefore, it would have been obvious to one of ordinary skill in the art to add the teachings of Yanai to the teachings of Zarrow and Sparks for the desirable purpose of improved performance.
Regarding claims 35 and 38, multicasting is known in the art. It is an efficient way of transferring data to simultaneously to multiple devices. Thus it would have been obvious to one of ordinary skill in the art to use multicasting in the system taught by Zarrow and Sparks for the desirable purpose of efficiency.

I. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of Sparks (USPN: 5,212,784) as applied to claim 31 above and further in view of Black (Computer Networks: Protocols, Standards and Interfaces, 2nd Edition, 1993). Zarrow and Sparks teach the limitations cited above in claim 34, however, Zarrow and Sparks do not explicitly teach a packet switched and cell network communication link. However, it is evident that issues such as applications, cost and other factors would dictate the use of one type of communication link versus another. It is really an issue of design choice. Black teaches in Computer Networks: Protocols, Standards and Interfaces, pages 159 -161, that organizations

with low to medium traffic volumes could benefit from a packet switch network because most of the carriers charge on the volume of traffic. Thus it would have been obvious to one of ordinary skill in the art to use the teachings of Zarrow and Sparks in a packet switch and cell network for a system with low to medium traffic volumes for the desirable purpose of efficiency and cost.

J. Claims 56-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of Staheli (USPN: 5,537,533) and Yanai (USPN: 5,544,537). Zarrow discloses a computer system comprising a CPU (inherent to a computer; Figure 1, Reference 10); a first storage system that is coupled to the CPU to store information written from the CPU (Figure 1, Reference 16); a second storage system (Figure 1, Reference 18); at least one communication link coupling the second storage system to the CPU (Figure 1, Reference 14; C 2, L 1-3); and a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information over the at least one communication link (C 4, L 41-67; C 5, L 1-35). Zarrow discloses the at least one communication link consisting of the Internet (Figure 1, Reference 14). Zarrow does not explicitly disclose the communication link consisting of the Intranet, however, Zarrow teaches mirroring data over a WAN for improved reliability. The Intranet is a smaller and secured network system compared to the WAN. However, it is well known in the art, particularly in networks used at a company, for devices (computers, storages, etc) to communicate over an Intranet. One of ordinary skill in the art would have recognized the befits

of Zarrow teachings and would have been motivated to use Zarrow's teachings in a system with devices communicating over an Intranet for the desirable purpose of improved reliability. Additionally, Zarrow does not disclose the communication link extending between the first and second storage systems such that the second system is coupled to the CPU via the first storage system. However, Yanai does teach this feature (Figure 1, Reference 40; C 4, L 50-56). Yanai teaches that this feature allows data mirroring from a primary data storage system to a secondary storage system without the intervention of the host which improves the performance of the system (C 2, L 25-33). Yanai also teaches that host (server) intervention seriously degrades the performance of the data transfer link between the host computer and the primary storage device. One of ordinary skill in the art would have also recognized that this feature allows the host to perform other task while the storage controller performs the mirroring operation, thereby improving the performance of the system. Therefore, one of ordinary skill in the art would have been motivated to add the teachings of Yanai to the teachings of Zarrow for the desirable purpose of improved performance.

K. Claim 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of Black (Computer Networks: Protocols, Standards and Interfaces, 2nd Edition, 1993) and the admitted prior art Yanai (USPN: 5,544,537).

Zarrow discloses a computer system comprising a CPU (inherent to a computer; Figure 1, Reference 10); a first storage system that is coupled to the CPU to store information written from the CPU (Figure 1, Reference 16); a second storage system (Figure 1, Reference 18); at least one communication link coupling the second storage system to the CPU (Figure 1, Reference 14; C

2, L 1-3); and a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information over the at least one communication link (C 4, L 41-67; C 5, L 1-35). Zarrow does not explicitly disclose the at least one communication link being one of a packet switched and cell switch network. However, it is evident that issues such as applications, cost and other factors would dictate the use of one type of communication link versus another. It is really an issue of design choice. Black teaches in Computer Networks: Protocols, Standards and Interfaces, pages 159 -161, that organizations with low to medium traffic volumes could benefit from a packet switch network because most of the carriers charge on the volume of traffic. Thus it would have been obvious to one of ordinary skill in the art to use the teachings of Zarrow in a packet switch and cell network for a system with low to medium traffic volumes for the desirable purpose of efficiency and cost. Zarrow nor Black explicitly discloses the communication link extending between the first and second storage systems such that the second system is coupled to the CPU via the first storage system. However, Yanai does teach this feature (Figure 1, Reference 40; C 4, L 50-56). Yanai teaches that this feature allows data mirroring from a primary data storage system to a secondary storage system without the intervention of the host which improves the performance of the system (C 2, L 25-33). Yanai also teaches that host (server) intervention seriously degrades the performance of the data transfer link between the host computer and the primary storage device. One of ordinary skill in the art would have also recognized that this feature allows the host to perform other task while the storage controller performs the mirroring operation, thereby improving the performance of the system. Therefore,

one of ordinary skill in the art would have been motivated to add the teachings of Yanai to the teachings of Zarrow and Black for the desirable purpose of improved performance.

L. Claims 62-63 and 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarrow (USPN: 5,991,813) in view of the admitted prior art Yanai (USPN: 5,544,537) and Vishlitzky (USPN: 5,960,216).

Regarding claims 62-63 and 65-67, Zarrow discloses a computer system comprising a CPU (Figure 1, Reference 10); a first storage system that is coupled to the CPU to store information written from the CPU (Figure 1, Reference 16); a second storage system (Figure 1, Reference 18); at least one communication link coupling the second storage system to the CPU, the at least one communication link including a network cloud (WAN) that is shared with at least one other resource so that no portion of the network cloud is dedicated exclusively to transferring information between the CPU and the second storage system (Figure 1, Reference 14; C 2, L 1-3); and a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud (C 4, L 41-67; C 5, L 1-35). Zarrow does not explicitly disclose the communication link extending between the first and second storage systems such that the second system is coupled to the CPU via the first storage system. However, Yanai does teach this feature (Figure 1, Reference 40; C 4, L 50-56). Yanai teaches that this feature allows data mirroring from a primary data storage system to a secondary storage system without the intervention of the host which improves the performance of the system (C 2, L 25-33). Yanai

also teaches that host (server) intervention seriously degrades the performance of the data transfer link between the host computer and the primary storage device. One of ordinary skill in the art would have also recognized that this feature allows the host to perform other task while the storage controller performs the mirroring operation, thereby improving the performance of the system. Therefore, one of ordinary skill in the art would have been motivated to add the teachings of Yanai to the teachings of Zarrow for the desirable purpose of improved performance. Zarrow nor Yanai explicitly disclose a communication link comprising a plurality of communication paths for parallel transfer of packets. Vishlitzky discloses using a plurality of communication paths for parallel transfer of packets (Figure 3a, Reference 21a-21b; C 4, L 62-67; C 6, L 27-47). It also known in the art to transfer data on parallel paths for increased throughput (such as Packet switch networks). Vishlitzky teaches that this feature enhances reliability by providing more than one path(channel) in case of a failure in one of the channels and this feature increases bandwidth by transferring data on all the channels compared to just a single channel. Thus, it would have been obvious to one of ordinary skill in the art to use a communication link comprising a plurality of communication paths to the system taught by Zarrow and Yanai for increased throughput, reliability and improved system performance.

(10) Response to Arguments

I. Introduction

Throughout the prosecution of the present application, Appellants have consistently asserted that the Examiner has used impermissible hindsight by selectively picking and choosing selected teachings from the prior art to arrive at the claimed invention. The Examiner disagrees.

The Examiner has consistently asserted that the Appellants have based such an assertion on arguments predicated on a bodily incorporation theory, which is self evident from Appellants' original Appeal Brief received May 9, 2002 and the Reply Brief received 11/19/2002, which is improper.

Appellants note that the Examiner has now for the first time taken a position about the configuration that one of ordinary skill in art would have been led to following the teachings of Zarrow and Yanai. This assertion is inaccurate. All of the rejections submitted to Appellants have textually indicated, consistent with the standard of review provided by the MPEP for a 103 rejection, the configuration that one of ordinary skill in the art would have been led to following the teachings of the prior art. The standard of review does not require that the Examiner provide a schematic explanation of the system derived at from the teachings of the prior art, which Appellants requested. It is clear that the textual explanation of the system provided in the rejections was not sufficient or adequate to Appellants as Appellant have noted in the Reply Brief that the Examiner has for the first time taken a position about the configuration only after the Examiner has provided a schematic diagram of the system.

II. The Examiner's Answer mailed on October 2, 2002 Does Not Mischaracterize Appellants' Argument Concerning The Nature of The System That One Skilled in The Art Would Have Been Led to Following the Teachings of Zarrow and Yanai.

Appellants continue to refute that they are not basing their arguments on a bodily incorporation theory; however, Appellants have insisted that one of ordinary skill in the art

would not be able to modify Zarrow's system to include a connection between the storage controllers as taught by Yanai without actually incorporating the structure of Yanai into Zarrow's system [1]. Appellants have stated explicitly in the Reply Brief (11/19/2002), "mirroring communication would be implemented directly by the storage systems over a dedicated link extending there between as taught by Yanai". Appellants have clearly incorporated the structure of Yanai into the configuration derived from the teachings of Zarrow and Yanai. This line of reasoning suggest that one of ordinary skill in the art would not be able to separate the concept/idea of providing direct communication between two storage controllers from the structure used to implement this feature; such reasoning undermines the skill of one of ordinary skill in the art.

Whether Appellants believe that other types of communication between the hosts would continue over the network does not help to resolve the issues pertinent to the rejection made for the claimed features. The claimed features do not dictate that the host cannot be connected to other host in the network for other types of communication.

III. One of Ordinary Skill in The Art Following The Teachings of Zarrow and Yanai Would Not Have Been Led To a System Employing A Dedicated High Speed Point-to-Point Communication Link Between the Storage Systems.

A. Zarrow

[1] In Appellants' Reply Brief on page 4, Appellants' have asserted that the while other types of communication between the host computers would continue over the network, mirroring communication would be implemented directly by the storage system over a dedicated link extending there between as taught by Yanai

Appellants' arguments regarding the teachings of Zarrow are narrow and misleading. Appellants' assert that Zarrow does not describe a system wherein a network connection is created between two computers to facilitate mirroring. This assertion is incommensurate with the claimed features [which do not stipulate creating a network connection to facilitate mirroring] and does not dispel the simply fact that Zarrow's system provides mirroring over a network. Appellants note that Zarrow indicates that the system may be used for other reasons outside of mirroring, referring to C 5 L, 55-64. Notwithstanding such, Appellants have ignored and attempted to dispel Zarrow's repeated indications of using the system/teachings particularly for remote mirroring (refer to Abstract; C 1, L 44-56; C 2, L 10-15; Figure 3; C 4, L 41-67; C 5, L 1-47).

Appellants make note that Zarrow indicates, in the Background of the Invention, that placing an SCSI device on a network or use of such a device has been difficult. It appears that Appellants make mention of this in an attempt to suggest that it would be difficult to modify Zarrow's system to provide a storage to storage connection. Regardless as to how difficult it was to place an SCSI device on a network or use of such a device, Zarrow has figured out how to interface two systems, including SCSI devices, over a network to perform remote mirroring. Zarrow describes in Figures 1 and 2 how the system is setup to allow remote mirroring over a network. Thus modifying Zarrow's system to perform the mirroring without host intervention would require removing the logic/software in the host, which assists with the mirroring process to another element. The concept of removing logic from a host to another element is well known in the art to relieve the host of certain task. Additionally, the modification would require rearranging the location of the network interface (reference 38, in Figure 1) so that the network

interface is coupled to the structure that performs/manages mirroring and accessing the storage device. The concept of rearranging parts to effectuate certain design goals is well known in the art also.

B. Yanai

Appellants' have asserted that Yanai specifically teaches that the communication link between the storage systems be a dedicated high-speed point-to-point communication link (C 2, L 55; C 4, L 59-62). The aforementioned sections of Yanai state that the storage controllers are coupled via at least one high-speed communication link. Yanai describes using point to point communication links; however, Yanai also describes using network connections such that the primary and secondary storage controllers are connected to FDDI networks, T 1or T 3 based networks and SONET networks (C 4, L 62-65). FDDI network communications links are most commonly used as a backbone to connect other networks (refer to Computer Networks, Page 166-167). Tanenbaum provides a diagram of a FDDI used a backbone in Figure 3-26. The diagram shows the FDDI communication link (FDDI ring) connected to a gateway, which is connected to other network configurations. The aforementioned configuration illustrates that Yanai's teachings are not limited to a dedicated point-to-point communication link, wherein the point-to-point connection is between two storage controllers.

C. Ohran

Appellants' reliance on Ohran's teachings do not aid in reconciling the issues at hand. Zarrow clearly teaches performing remote mirroring using a non-dedicated communication link.

D. Appellants' assert that the Examiner has ignored teachings of Zarrow that teach away from the configuration that the Examiner alleges one of ordinary skill in the art would have been led to following the combined teachings of Zarrow and Yanai.

As noted above, Appellants' have ignored and attempted to dispel Zarrow's repeated indications of using the system/teachings particularly for remote mirroring (refer to Abstract; C 1, L 44-56; C 2, L 10-15; Figure 3; C 4, L 41-67; C 5, L 1-47). Notwithstanding Zarrow's indications, one of ordinary skill in the art may in fact desire to setup a network system merely to provide remote mirroring. Appellants appear to mention that Zarrow indicates other reasons why it may be desirable for a host computer to access a remote SCSI device over a network in an attempt to suggest that one of ordinary skill in the would only conjure the idea of setting up a network to for the sole purpose of providing remote mirroring if Zarrow suggested it. Appellants appear to have a narrow interpretation of how obviousness is established and a diminished skill level for one of ordinary skill in the art. The test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). The "hypothetical person having ordinary skill in the art' to which the claimed subject matter pertains would, of necessity have the capability of understanding the scientific and engineering principles applicable to the pertinent

art." Ex parte Hiyamizu, 10 USPQ2d 1393, 1394 (Bd. Pat. App. & Inter. 1988) and thus one of ordinary skill in the art would have sufficient technical savvy to conjure up the idea to develop a system that performed mirroring only or other functionality.

Appellants emphasize that Zarrow indicates that placing an SCSI device on a network or use of such a device has been difficult. This point is noted, however, it does not challenge the idea of modifying Zarrow's system since Zarrow has figured out how to interface two systems, including SCSI devices, over a network to perform mirroring. Zarrow describes in Figures 1 and 2 how the system is setup to allow remote mirroring over a network. Thus modifying Zarrow's system to perform the mirroring without host intervention would require removing the logic/software in the host, which assists with the mirroring process to another element, such as the controller. The concept of removing logic from a host to another element is well known in the art to relieve the host of certain task. Additionally, the modification would require rearranging the location of the network interface (reference 38, in Figure 1) so that the network interface is coupled to the structure that performs/manages mirroring and accessing the storage device. As illustrated by Applicant's own drawings (refer to Figure 2), the storage controllers are not equipped with the logic that interfaces to the network. The storage controllers are coupled to the network interface units and the network controllers [described as a computer], which together provide the storage to storage communication.

E. Appellants have asserted that the Examiner has picked selected teachings from Yanai while ignoring disclosure in Yanai that teaches away from the claimed invention.

As noted above, Yanai discloses using FDDI communication links to couple the storage controllers and thus it is evident that Yanai's teachings are not limited to a dedicated point-to-point communication link, wherein the point-to-point connection is dedicated and directly between two storage controllers. Yanai does not state nor imply that in order to perform remote mirroring without host intervention, it is absolutely necessary to use a particularly type of communication link. One of ordinary skill in the art would have known that Yanai's teachings were directed to connecting a secondary storage system storage to a primary storage system to perform data mirroring without host intervention which provides improved performance and one of ordinary skill in the art would have also known of different implementations of communication links as point to point communication links were not the only type of communication links known at the time of the invention as is shown in the teachings of Zarrow. It is clear that the communication link in Yanai's system functions merely to couple two systems wherein the type of communication link used does not alter the fact that the secondary storage system is connected to the CPU via the primary storage system and not directly to the host CPU so that mirroring is performed without intervention from the host CPU.

The Examiner indicated to Appellants that it is their burden to prove that Yanai's system can only function via a point-to-point communication link, since the reference does not state or imply such. The Appellants have selectively picked teachings of Yanai in a weak attempt to conclude that the modification of Zarrow with Yanai's teachings [to allow remote mirroring without host intervention] absolutely requires the use of a dedicated point-to-point communication link.

Appellants have consistently asserted arguments that are predicated on a bodily incorporation theory. Appellants argue that is it the Examiner's burden to establish some motivation for modifying the point-to-point communication link taught by Yanai. The only way basis for Appellants' argument is the bodily incorporation of Yanai's structure into Zarrow's system. The MPEP states:

> "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations".
>
> and
>
> "To reach a proper determination under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed

invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art".

" The rationale to modify or combine the prior art does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law".

The Examiner's position detailed in the Final Rejection is that Yanai's teachings are added to Zarrow's teachings. Yanai teaches coupling a secondary storage system to a primary storage via a communication link, thereby coupling the secondary storage system to a CPU via the primary storage system for the purpose of mirroring data without intervention of the host. Zarrow specifically teaches mirroring data through a network cloud (WAN). However, in doing so, Zarrow allows host intervention (mirroring software on host machine controls the mirroring operation) wherein the secondary storage is not coupled to the host (CPU) through a primary storage system, which Yanai states degrades the performance of the system by overly burdening the host CPU with the task of writing the data to the secondary storage system and thus

dramatically impacts and reduces system performance (C 2, L 17-25), which suggests the desirability of using Yanai's teachings. Thus one of ordinary skill in the art would have recognized the performance benefits of the combined teachings of Zarrow and Yanai and would have been motivated to add the teachings of Zarrow to Yanai for improved performance. The Examiner has used the secondary reference for the specific teaching of coupling a secondary storage system to a host CPU via a primary storage system and not for using a point-to-point communication link. Therefore, motivation to replace the direct point-to-point communication link in Yanai's system is not provided, as this feature was not relied upon. As stated above, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

IV.

A. Appellants reliance upon Ohran does not dispel the teachings of Zarrow, which clearly teach remote mirroring without employing a dedicated communication link. As Appellants have pointed out, a proper analysis under section 103 must take into account all of the teachings of the prior art.

B. As noted above, Zarrow has figured out how to interface two systems, including SCSI devices, over a network to perform remote mirroring. Zarrow describes in Figures 1 and 2 how

the system is setup to allow remote mirroring over a network. Thus modifying Zarrow's system to perform the mirroring without host intervention would require removing the logic/software in the host that assists with the mirroring process to another element such as the storage controller. The concept of removing logic from a host to another element is well known in the art to relieve the host of certain task. Additionally, the modification would require rearranging the location of the network interface (reference 38, in Figure 1) so that the network interface is coupled to the structure that performs/manages mirroring and accessing the storage device. The concept of rearranging parts to effectuate certain design goals is well known in the art also.

Appellants assert that Zarrow and Yanai do not teach a storage system having intelligence for limiting access to particular volumes of storage based upon the identity of a device seeking such access. This argument is incommensurate with the claims.

V. The Examiner has not used impermissible hindsight.

The Examiner has made the above rejection within consistent with the guidelines set out in the MPEP. The Examiner has provided motivation for combining Zarrow and Yanai. Additionally, the Examiner has reasoned from knowledge generally available to one of ordinary skill in the art that one of ordinary skill in the art would have known that Yanai's teachings were directed to connecting a secondary storage system storage to a primary storage system to perform data mirroring without host intervention which provides improved performance and one of ordinary skill in the art would have also known of different implementations of communication links as point to point communication links were not the only type of communication links known at the time of the invention as is shown in the teachings of Zarrow. It is clear that the

communication link in Yanai's system functions merely to couple two systems wherein the type of communication link used does not alter the fact that the secondary storage system is connected to the CPU via the primary storage system and not directly to the host CPU so that mirroring is performed without intervention from the host CPU.

VI. Rejection of Claims under Issue 3

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the teachings of Zarrow and Yanai disclose a communication link coupled to a network cloud. Vishlitzky teaches the concept of employing a plurality of communication paths for parallel transfer of data (Figure 3a, Reference 21a-21b; C 4, L 62-67; C 6, L 27-47), which improves throughput and thereby improves the performance of the system. These enhancements provide the motivation for the desirability of this feature. Hence, the system comprising the combined teachings of Zarrow, Yanai and Vishlitzky would employ a communication path coupled to a network cloud wherein the communication path comprises a plurality of communication paths for parallel transfer of data.

VII.

Refer to section V above.

VIII.

Claim 61 was inadvertently left in the rejection. The typographical error has been corrected.

(11) Conclusion

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Kimberly McLean

KIMBERLY MCLEAN-MAYO
PRIMARY EXAMINER

Conferees:

Donald Sparks

DONALD SPARKS
SUPERVISORY PATENT EXAMINER

Eddie Chan

EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100